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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,104	09/16/2003	Juan Jose Gonzalez	2213P022	1818

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EXAMINER

VO, TUYET THI

ART UNIT	PAPER NUMBER
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2821

DATE MAILED: 08/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/663,104

Applicant(s)

GONZALEZ ET AL.

Examiner

Tuyet Vo

Art Unit

2821

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 May 2005.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6-16, 18-25, 27 and 28 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-4, 6-8, 11-16, 18, 19, 22-25 and 28 is/are rejected.
7) ☒ Claim(s) 9, 10, 20, 21 and 27 is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Applicant's arguments filed February 19, 2004 have been fully considered but they are not persuasive due to a new ground rejection that has been applied against the claim invention as below.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-4, 6-8, 13-16, 18, 19, 24, 25 and 28 are rejected under 35 U.S.C. 102(e) as being anticipated by Abatchev et al. (US Pub. 2003/0024643), hereinafter Abatchev.

Regarding claims 1, 2, 8, 14, 15, 19 and 24, Abatchev discloses a plasma etching system (Figs. 1A and 1B) and method as well comprising:

A coil (120) to couple power to a plasma in a plasma chamber (102a); and pulse power generator (114a, 117) coupled to the coil for repeatedly apply high power pulse to the coil to increase the reaction rate of the plasma within the chamber and to apply a low power pulse to the coil between applications of the high power pulses (Fig. 2B and [0027]-[0030]), wherein the pulse power generator being detuned when providing low power pulses alternately the high power pulses affecting the temperature of the plasma within the chamber would be inherently diminished, wherein the amplitude and frequency of the pulses being varied/changed/modulated based on the conditions of the plasma, in that, the voltage/amplitude and frequency of RF signal

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vary depending upon the plasma gases within the chamber ([0026], [0027], [0029], [0030] and [0032]).

Regarding claims 6 and 18, Abatcher teaches the high power pulse comprises a coil being pulsed at a selected alternating current frequency (Figs 1A and 2B).

Regarding claims 3, 4, 7, 13 and 16, Abatchev further discloses the high power pulses and the low power pulses being applied alternately in constant space time intervals (Fig. 2B), wherein the amplitude and frequency of the pulses being varied/changed/modulated based on the conditions of the plasma, in that the voltage/amplitude and frequency of RF signal vary depending upon the plasma gases within the chamber ([0026], [0027], [0029], [0030] and [0032]).

Regarding claims 25 and 28, Abatcher also discloses a control unit provides instruction/process to control the pulse power generator for generating, modulating and applying amplitude/frequency of high/low power pulses alternately in a constant time space manner ([0021], [0025] and [0026]).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 11, 12, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abatchev in view of Pan et al. (US Pat. 6,679,981), hereinafter Pan.

Abatchev discloses substantially the claim invention as noted above except for the coil is not an air couple coil whereas plasma generated through a core.

Pan discloses a plasma reaction chamber utilizing a inductive plasma loop, wherein a alternating power applies through an air couple coil (40) associated with a magnetic core for improving efficiency of magnetic coupling (col. 4, lines 37-44).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize an air-couple coil supported by a magnetic core as suggested by Pan into the Abatchev inductive plasma system in order to improve magnetic coupling so as to achieve an uniformity of high density plasma.

Allowable Subject Matter

5. Claims 9, 10, 20, 21 and 27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
6. The following is a statement of reasons for the indication of allowable subject matter: the prior fails to establish an apparatus and method as well for controlling reaction of plasma within the plasma chamber by applying low power pulse as detuning a pulsed power generator, wherein detuning comprises a change the operating frequency of the pulsed power generator beyond the range of an active matching network between the pulsed power generator and the plasma as required in claims 9, 20 and 27 or the detuning in the action to change the settings of an active matching network as required in claims 10 and 21.

Responding to Argument

The argument against Abatchev (US Pub. 2003/0024643) applied toward claims 1, 14 and 24 filed May 09, 2005 has not been found persuasive for the following reason.

As noted above in the new rejection, once amplitude and/or frequency of the high power pulse varied according/depending upon the gases within the chamber (plasma gas) will effect plasma processes by accumulating more charge, so as to improve/increase etching process on the surface of semiconductor product ([0026]). Such accumulating charge within the chamber conditions a fast/accuracy process of plasma gas in a desire manner toward a specific product. For this reason, withdrawing the rejection holding claims 1, 14 and 24 is not warranted in this office action.

Correspondence

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuyet Vo whose telephone number is 571 272 1830. The examiner can normally be reached on Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong can be reached on 571 272 1834. The fax phone numbers for the organization where this application or proceeding is assigned are 571 273 8300 for regular communications and for After Final communications.



Tuyet Vo

Primary Examiner

July 26, 2005